

The specification has been revised to correct minor informalities as well as to place the application in better form for U.S. practice. Applicant has amended the title in accordance with the Examiner's recommendation. As to the objection to Figure 4, Applicant's amendment to the specification obviates the Examiner's requirement to label it as prior art. Accordingly, withdrawal of these objections is earnestly solicited by Applicant.

Preferred Embodiment

The preferred embodiment of the present application relates to a controlling method for an electronic still camera which picks up image signals through a solid state imaging device such as a CCD image sensor, and records still pictures on a single recording medium such as a memory card or magnetic disk. More particularly, the present application relates to a recording control method for an electronic still camera ^{which} has an electronic view finder for displaying a moving picture of a photographic subject.

The operation of the camera is described with references to Figures 3 and 4. When power to the camera is turned ON, the still camera operates in the movie mode, where the system controller 10 drives a CCD image sensor 2 through the CCD driver 6, on the basis of vertical synchronizing signals generated at a frequency of 1/60 seconds. In the movie mode, the CCD image

sensor 2 is read according to pixel combination. Specifically, the signal charges of each pixel 3 of the even horizontal scanning lines of the CCD are added to a signal charge of an individual pixel 3 which is disposed on the same column, but which is located in the preceding odd horizontal scanning line, thereby providing image signals for a first or odd field. Thereafter, to obtain field image signals of an even field, the signal charge of each pixel of an even horizontal scanning line is added to a signal charge stored in one of those pixels detecting the same color in one of two adjacent odd horizontal scanning lines. Therefore, one feature of the present application is that the types of individual pixels added are different relative to which field is being added (see Figure 2 odd field or even field). Additionally, field image signals of the present application are only produced or added in the movie mode.

Responsive to a shutter release operation, the still camera then begins operating in the recording mode. In the recording mode, the signal charges of the individual pixels 3 are picked up sequentially from every horizontal scanning line, without being pixel-combined (i.e., without adding values of adjacent pixels 3). Therefore, the charge storage time T2 is twice the latest charge storage time T1 just prior to the shutter release operation. A second feature of the present application is that the signal charges of the individual pixels are read out without being added in the recording mode, so that the

signal level is determined in accordance with the level of the field image signal.

Additionally, as discussed above, another aspect of the present application is the increasing of the charge storage time when switching between the movie mode and recording mode, so that the second charge storage time in the recording mode is greater than the first charge storage time in the movie mode, whereby the second charge storage time is a function of the first charge storage time. Doubling of the charge storage time between modes makes it possible to set the appropriate signal levels of the recording image signals in the same and/or proper range of the field image signals. This allows the setting of the luminance and color balance of the recorded still picture in the same range as the moving picture displayed on the view finder. The same effect will result from doubling the gains of the amplifier 8 in the recording mode. Doubling the amp gain for the recording mode upon a shutter release operation also allows for the setting of luminance and color balance of a recorded still picture to be in the same range as that of a moving picture displayed on the view finder.

35 U.S.C. § 103 Rejection

The Examiner has rejected claims 1-6 under 35 U.S.C. § 103(a) as being unpatentable over Sasaki (U.S. Patent No. 4,837,628) in view of Yokoyama

(U.S. Patent No. 5,239,380), and further in view of Morimura et al. (U.S. Patent No. 4,570,178), Miyazaki (U.S. Patent No. 4,929,824) and Parulski et al. (U.S. Patent No. 5,828,406). This rejection is respectfully traversed.

The Examiner alleges that Sasaki discloses all the claimed subject matter of the present application, save for the claimed field addition steps, automatic exposure mechanism and sequential scanning steps of independent claims 1 and 5, as well as the disclosure of 3-color separation filters in the preamble of independent claim 5. However, Sasaki appears directed to a general electronic still camera which discloses, at best, no more than the structure of a conventional electronic still camera. Of the references cited by the Examiner, Yokoyama appears to be the most relevant and is discussed in detail below.

Yokoyama

The Examiner cited Yokoyama to teach the steps of obtaining field signals for odd and even fields. Yokoyama discloses a method of driving a solid state imaging device where signal charges are read out simultaneously and independently from all light receiving members of the imaging device and a vertical CCD register.

According to Yokoyama, signal charges are transferred by two-by-two transfer steps in one horizontal blanking period of time, and the signal charges

obtained from the adjacently disposed light receiving members can be added to each other through a horizontal CCD register so that the field storage reading can be made possible (see, column 3, lines 40-47). Thus, it appears that Yokoyama makes no distinction as to how the respective kinds of pixels are added relative to whether the pixel is in an odd field or in an even field.

Distinction Over the Prior Art

Applicant respectfully submits that Sasaki fails to teach, either alone or in combination with the other references, a method of controlling an electronic still camera, comprising at least the steps of: obtaining field image signals of an odd field by adding a signal charge stored in each of those pixels aligned in even horizontal scanning lines of the solid state imaging device to a signal charge stored in one of those pixels detecting the same color in one of two adjacent odd horizontal scanning lines; obtaining field image signals of an even field by adding the signal charge of each pixel of the even horizontal scanning lines to a signal charge stored in one of those pixels detecting the same color in the other of the two adjacent odd horizontal scanning lines; and starting, in response to the shutter release operation, to read signal charges stored in the individual pixels of the solid state imaging device by sequential scanning each horizontal scanning line, to provide image signals of one frame to record.

The Examiner admits that Sasaki fails to specifically teach various aspects of independent claims 1 and 5. Applicant respectfully submits that even assuming arguendo that Yokoyama could be combined with Sasaki, which Applicant does not admit, Yokoyama would still fail to make up for the previously mentioned deficiencies of Sasaki and the alleged combination would fail to render independent claim 1 or 5 of the present application obvious for the following reasons.

Unlike the claimed field image steps of independent claims 1 and 5, Yokoyama teaches that the addition of pixels are the same, relative to both fields, odd or even. This is antithetical to the present invention, which adds signal charges differently with respect to the odd or even fields.

Additionally, the supporting references fail to teach or suggest reading signal charges stored in the individual pixels of the solid state imaging device by sequential scanning the recording mode (i.e., individual pixels are read out without being added in the recording mode). This is significant in that sequential scanning requires the charge storage time to be doubled in the recording mode, so that the still camera can provide image signals with proper signal levels as to luminance and white balance.

Furthermore, with respect to independent claim 5, Sasaki fails to teach or suggest, alone or in combination with any of the other references, the step of

determining, in response to the shutter release operation, the second charge storage time based on the first charge storage time. Applicant respectfully submits that, even assuming arguendo that any of the secondary references could be combined with Sasaki, which Applicant does not admit, these references would still fail to make up for the previously mentioned deficiency of Sasaki. Accordingly, the alleged combination would still fail to render independent claim 5 of the present application obvious for the aforementioned reasons.

New Claims 7-9

New claims 7-9 have been added in order to broaden the scope of protection for Applicant's invention. Applicant respectfully submits that claims 7-9 are allowable for at least reasons similar to those for claims 1 and 5.

CONCLUSION

Accordingly, in view of the above amendments and remarks, reconsideration of the objections and rejections and allowance of each of the claims 1-9 in connection with the present application is earnestly solicited. Should there be any outstanding matters which need to be resolved in the

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present application, the Examiner is respectfully requested to contact John A. Castellano, Registration No. 35,094, at the telephone number of the undersigned below to conduct an interview.

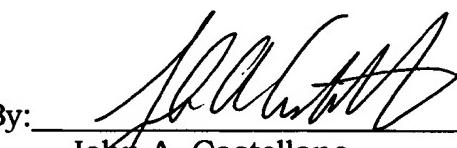
Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), the Applicant respectfully petitions for a one (1) month extension of time until April 8, 1999 for filing a response in connection with the present application and the required fee of \$110.00 is attached hereto.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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